

"Express Mail" mailing label number EJ737390440US

Date of Deposit Jun. 4, 2001

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**PATENT APPLICATION  
DOCKET NO. 10007651-1**

**SYSTEM AND METHOD FOR PREPARING IMAGING DATA FOR  
PRINTING TO A REQUESTED WEB SERVICE**

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2 SYSTEM AND METHOD FOR PREPARING IMAGING DATA FOR  
3 PRINTING TO A REQUESTED WEB SERVICE

4 The present invention generally relates to an improved system  
5 and method for preparing imaging data for printing to a requested web service.  
6 More specifically, it relates to an improved system and method for preparing  
7 imaging data for printing from an application to a requested web service from a  
8 computer with a web browser and a capture driver having a printer driver and a  
9 port monitor, wherein the computer is linked to a personal imaging repository  
10 having an imaging data store for storing the imaging data and a composition  
11 store for storing imaging compositions having links to the imaging data  
12 serviced as a single unit.

13 The current available printing systems implemented with a web  
14 interface generally use specialized printer drivers and port monitors to capture  
15 the imaging information for uploading to the server providing the printing.

1 However, under these current systems, the imaging information is  
2 fundamentally associated with the server. As a result, the imaging information  
3 is limited for use only with the server that downloaded the imaging data.

4           One of the most recognized printing systems implemented with a  
5 web interface currently known today is the web site "Mimeo.com" provided by  
6 Mimeo.com, Inc. The Mimeo.com is an online copy center where users can  
7 print a document straight from their desktop application to the Mimeo.com  
8 printers. Specific software from Mimeo.com must first be downloaded and  
9 installed onto the user computers. Once the software is installed, users can  
10 choose a Mimeo.com printer from the print menu when printing from their  
11 desktop application. Users can then choose the Mimeo.com printer just as if it  
12 were a typical printer. Another menu will then pop up on users' screens that  
13 enables the user to select the current document and transfer it to the  
14 Mimeo.com web site. At the site, the document is transferred to a storage place  
15 assigned to the user by the Mimeo.com server, and a web content with a  
16 preview of the document and printing options will be displayed to the user.  
17 The document remains in the storage place for user selection for a limited time.

18           One problem with the Mimeo.com system is that the downloaded  
19 document can be used only on the Mimeo.com web site and users are not  
20 allowed to send the downloaded document to another online service. Another  
21 problem is that the user must choose a specific printer, and the document is  
22 downloaded based on the chosen specific printer. For example, if the user  
23 chooses a black and white printer, the downloaded document can be used only  
24 with the black and white printers. If the user wishes to print the same  
25 document to a color printer, the document has to be printed and downloaded  
26 again with the color printer chosen. This can be burdensome, inflexible and  
27 wasteful of bandwidth.

1 Another known printing system from HDE.com provided by  
2 HDE Inc., which provides an Internet Printing solution that allows printing  
3 through a firewall system over the Internet. Again, special software must be  
4 installed on the end-user's computer transmitting the print jobs to a destination  
5 printer over the Internet. In addition, the destination printer also contains  
6 special firmware to receive these transmitted print jobs.

7 Still the problem with the HDE's Internet printing solution is that  
8 both the user's computer and the printing device have to be preconfigured and  
9 installed with specific software before users can utilize the printing service.  
10 The problem with the need for preconfiguration is very burdensome and  
11 inflexible. Furthermore, it is extremely inconvenient for users of any  
12 computing devices that are more mobile and may require connection to  
13 different network environments offered by various location sites.  
14

#### 15 BRIEF SUMMARY OF THE INVENTION

16 The present invention is directed to an improved system and  
17 method for preparing imaging data for printing to a requested web service from  
18 an application loaded on a user's computing device. More particularly, the  
19 present invention relates to a system and method for preparing imaging data for  
20 printing from an application from a computer or computing device with a web  
21 browser and a capture driver having a printer driver and a port monitor to a  
22 requested web service provided by a web service server, wherein the computer  
23 is linked to a personal imaging repository having an imaging data store for  
24 storing the imaging data and a composition store for storing imaging  
25 compositions having links to the imaging data serviced as a single unit.

1           The present invention provides a system that includes an imaging  
2 client computer having a web browser for printing from the application, which  
3 may be a desktop application, to the requested web service, a personal imaging  
4 repository associated with a particular user for storing imaging data that is to be  
5 accessed by the requested web service, and a capture driver for preparing the  
6 imaging data for transfer to the personal imaging repository. The personal  
7 imaging repository acts as an exchange infrastructure between the imaging data  
8 and the available web services on the Internet.

9           The present invention further provides a method that includes the  
10 steps of transferring the imaging data to the imaging data store, creating an  
11 imaging composition having links to the imaging data stored in the imaging  
12 data store, saving the imaging composition in the composition store and  
13 directing the web browser to the requested web service.

#### 14           DESCRIPTION OF THE DRAWINGS

15           FIGURE 1 is a preferred architectural diagram of a network  
16 system in which the present invention can be implemented;

17           FIG. 2 is an architectural diagram of a second network system in  
18 which the present invention can be implemented; and,

19           FIG. 3 is a flowchart illustrating the preferred functionality of the  
20 print method of the present invention.

#### 21           GLOSSARY OF TERMS AND ACRONYMS

22           The following terms and acronyms are used throughout the  
23 detailed description:

24           Client-Server. A model of interaction in a distributed system in  
25 which a program at one site sends a request to a program at another site and

1 waits for a response. The requesting program is called the "client," and the  
2 program which responds to the request is called the "server." In the context of  
3 the World Wide Web (discussed below), the client is a "Web browser" (or  
4 simply "browser") which runs on the computer of a user; the program which  
5 responds to browser requests by serving Web pages, or other types of Web  
6 content, is commonly referred to as a "Web server."

7           Composition store. Composition store refers to a network service  
8 or a storage device for storing imaging composition(s) that can be accessed by  
9 the user or other web services.

10           Content. A set of executable instructions that is served by a  
11 server to a client and that is intended to be executed by the client so as to  
12 provide the client with certain functionality. Web content refers to content that  
13 is meant to be executed by operation of a Web browser. Web content,  
14 therefore, may non-exhaustively include one or more of the following: HTML  
15 code, SGML code, XML code, XSL code, CSS code, Java applet, JavaScript  
16 and C-"Sharp" code.

17           Exchange infrastructure. An exchange infrastructure is a  
18 collection of services distributed throughout a network that stores imaging data  
19 associated with a particular user through a user profile.

20           Hyperlink. A navigational link from one document to another,  
21 from one portion (or component) of a document to another, or to a Web  
22 resource, such as a Java applet. Typically, a hyperlink is displayed as a  
23 highlighted word or phrase that can be selected by clicking on it using a mouse  
24 to jump to the associated document or document portion or to retrieve a  
25 particular resource.

1           Hypertext System. A computer-based informational system in  
2   which documents (and possibly other types of data entities) are linked together  
3   via hyperlinks to form a user-navigable "web."

4           Imaging composition. An imaging composition comprises links  
5   to imaging data serviced as a single unit.

6           Imaging data. Imaging data refers to digital data capable of being  
7   represented as two dimensional graphics, such as a Portable Document Format  
8   ("PDF") file or a Joint Photographic Experts Group ("JPEG") file.

9           Imaging data store. Imaging data store refers to a network  
10   service or a storage device for storing imaging data that can be accessed by the  
11   user or other network services. The imaging data store preferably accepts the  
12   imaging data in multiple standard file formats, and the imaging data is  
13   converted into these file formats when necessary depending on the  
14   implementation.

15           Internet. A collection of interconnected or disconnected networks  
16   (public and/or private) that are linked together by a set of standard protocols  
17   (such as TCP/IP and HTTP) to form a global, distributed network. (While this  
18   term is intended to refer to what is now commonly known as the Internet, it is  
19   also intended to encompass variations which may be made in the future,  
20   including changes and additions to existing standard protocols.)

21           World Wide Web ("Web"). Used herein to refer generally to both  
22   (i) a distributed collection of interlinked, user-viewable hypertext documents  
23   (commonly referred to as Web documents or Web pages) that are accessible via  
24   the Internet, and (ii) the client and server software components which provide  
25   user access to such documents using standardized Internet protocols. Currently,  
26   the primary standard protocol for allowing applications to locate and acquire  
27   Web documents is HTTP, and the Web pages are encoded using HTML.

1 However, the terms "Web" and "World Wide Web" are intended to encompass  
2 future markup languages and transport protocols which may be used in place of  
3 (or in addition to) HTML and HTTP.

4 Web Site. A computer system that serves informational content  
5 over a network using the standard protocols of the World Wide Web.  
6 Typically, a Web site corresponds to a particular Internet domain name, such as  
7 "HP.com," and includes the content associated with a particular organization.  
8 As used herein, the term is generally intended to encompass both (i) the  
9 hardware/software server components that serve the informational content over  
10 the network, and (ii) the "back end" hardware/software components, including  
11 any non-standard or specialized components, that interact with the server  
12 components to perform services for Web site users. Importantly, a Web Site  
13 can have additional functionality, for example, a Web site may have the ability  
14 to print documents, scan documents, etc.

15 HTML (HyperText Markup Language). A standard coding  
16 convention and set of codes for attaching presentation and linking attributes to  
17 informational content within documents. (HTML 2.0 is currently the primary  
18 standard used for generating Web documents.) During a document authoring  
19 stage, the HTML codes (referred to as "tags") are embedded within the  
20 informational content of the document. When the Web document (or HTML  
21 document) is subsequently transferred from a Web server to a browser, the  
22 codes are interpreted by the browser and used to display the document.  
23 Additionally in specifying how the Web browser is to display the document,  
24 HTML tags can be used to create links to other Web documents (commonly  
25 referred to as "hyperlinks"). For more information on HTML, see Ian S.  
26 Graham, The HTML Source Book, John Wiley and Sons, Inc., 1995 (ISBN  
27 0471-11894-4).



1 HTTP (HyperText Transport Protocol). The standard World  
2 Wide Web client-server protocol used for the exchange of information (such as  
3 HTML documents, and client requests for such documents) between a browser  
4 and a Web server. HTTP includes a number of different types of messages  
5 which can be sent from the client to the server to request different types of  
6 server actions. For example, a "GET" message, which has the format GET  
7 <URL>, causes the server to return the document or file located at the specified  
8 URL.

9 URL (Uniform Resource Locator). A unique address which fully  
10 specifies the location of a file or other resource on the Internet or a network.  
11 The general format of a URL is protocol: //machine address:port/path/filename.

12 User Information. User information is identification and security  
13 information used in accessing imaging composition(s) and imaging data  
14 associated with a particular user profile. It is preferably accessed either  
15 directly or indirectly through methods provided by an extension component  
16 integrated into the web browser.

17 PDA (Personal Digital Assistant). A small hand-held computer  
18 used to write notes, track appointments, email and web browser with generally  
19 with far less storage capacity than a desktop computer.

20 Personal imaging repository. A personal imaging repository is a  
21 conceptual term describing the exchange infrastructure used to exchange  
22 imaging composition and imaging data with web services. Users are associated  
23 with their imaging data through user profiles.

## 24 DETAILED DESCRIPTION

25 Broadly stated, the present invention is directed to an improved  
26 system and method for preparing imaging data for printing to a requested web

1 service from an application loaded on a user's computing device. The system  
2 and method prepare imaging data to be serviced and direct it to a requested web  
3 service pursuant to a user request from an application. The imaging data is first  
4 stored in a personal imaging repository, which acts as an exchange  
5 infrastructure between the imaging data and available web services on the  
6 Internet. As a result, the imaging data stored in the personal imaging  
7 repository can freely be used by other web services or the user at a later time.  
8 Furthermore, it is no longer necessary for the imaging data to be downloaded to  
9 the requested web service. Rather, once the imaging data is stored in the  
10 personal imaging repository, it can be used later by any other web services.

11 The preferred network system in which the present invention can  
12 be implemented is shown in FIG. 1 and indicated generally at 10. Because  
13 there are numerous ways of implementing the network topology of the present  
14 invention, the current preferred network system is just one way. As a result, it  
15 should be understood that other network topologies are contemplated and are  
16 within the scope of the present invention. In the preferred embodiment, an  
17 imaging client computer 12 is connected to a web service server computer 14  
18 that provides a requested web service 16 via a network 18. The imaging client  
19 computer 12 establishes a connection with the web service server computer 14  
20 upon the user selecting PRINT from an application 21 installed on the imaging  
21 client to the requested web service 16. It should be emphasized that the  
22 implemented network would most likely have multiple web services that are  
23 available over the Internet, and FIG. 1 shows only the requested web service.

24 The imaging client computer 12 also includes the typical  
25 components of a general computer, such as a display interface 22 and an input  
26 interface 24. In addition, the imaging client computer 12 preferably includes a  
27 web browser 28 and a personal imaging repository 30. Once the requested web

1 service 16 is connected with the imaging client computer 12, the web service  
2 returns a web content 32 to the web browser 28. The web browser also  
3 includes an extension component 34, which makes use of user information 36  
4 to provide web content with access to personal imaging repository 30  
5 belonging to a particular user.

6 In addition, the imaging client also includes a capture driver 40,  
7 which is an important aspect of the present invention. The capture driver 40  
8 prepares the imaging data from the application requesting printing to the  
9 requested web service 16. The capture driver 40 is further configured as one of  
10 the print options of the operating system as if it were a typical printer. Users  
11 can select to print to the capture driver 40 from any of their applications just  
12 like any typical printers. However, unlike a typical printer, users, using the  
13 capture driver, can print to a requested web service. In the preferred  
14 embodiment, the capture driver 40 has four separate components, namely, an  
15 uploader 42, a converter 44, a port monitor 46 and a printer driver 48. More  
16 specifically, the port monitor 46 is responsible for directing the imaging data to  
17 the personal imaging repository 30, and the uploader 42, as its name indicates,  
18 uploads the imaging data to the personal imaging repository as directed by the  
19 port monitor. The converter 44 and printer driver 48 are both converters. The  
20 printer driver 48 converts the imaging data requested for printing into a  
21 predefined format suitable for printing to a peripheral device, which is  
22 preferably in the postscript format because it works with most commercially  
23 available printers. The converter 44, on the other hand, converts the imaging  
24 data into the default format of the personal imaging repository 30.

25 The components of the capture driver 40 are configured to work  
26 with the operating system of the imaging client 12 through an Application  
27 Program Interface ("API") 50 and a Graphic Display Interface ("GDI") 52,

1 which is well known in the art. The API 50 provides an interface that allows  
2 an application program to access the operating system and other services, and  
3 the GDI 52 provides an interface that allows graphics to be displayed in  
4 Microsoft Windows. Different interfaces may be used with the present  
5 invention, which depends greatly upon the configuration of the operating  
6 system installed on the imaging client. Although an implementation with MS  
7 Windows is shown in FIG. 1, implementations with other operating systems are  
8 contemplated and are within the scope of the present invention.

9 It should also be noted that the capture driver 40 can be  
10 implemented in a variety of ways. In fact, some of the components can be  
11 excluded. It is not necessary that the imaging data be converted into the  
12 predefined format. The printer driver 48 is implemented to generate device  
13 independent data. Similarly, since the converter 44 converts the imaging data  
14 into the default format of the personal imaging repository, the converter 44  
15 does not necessarily have to be included. For example, the predefined format  
16 can be the same as the default format. Alternatively, the burden of converting  
17 the imaging data can be placed on the web service accessing the data.  
18 Consequently, there are numerous ways to implement the capture driver 40,  
19 and these other implementations are within the scope of the present invention.

20 The personal imaging repository 30, on the other hand, preferably  
21 includes an imaging data store 54, i.e., a digital memory, for storing the  
22 imaging data and a composition store 56 for storing imaging composition(s) of  
23 the imaging data that are serviced as a single unit. An imaging composition  
24 preferably comprises links to the imaging data, which can be located on  
25 another network service. As a result, the composition store 56 stores only the  
26 imaging compositions. The imaging data store 54, on the other hand, is any  
27 imaging data store located on any computer that contains the imaging data.

1 More specifically, each web service can have its own imaging data store 54  
2 available to the public.

3 For example, at some previous time, a user may have printed an  
4 article from a web service site, resulting in an imaging composition being  
5 created and stored in the user's composition store 56. Since the created  
6 imaging composition contains only the link to the imaging data for this article  
7 stored on the web service site, the imaging data for the article is not in the  
8 imaging data store 54 located on the imaging client 12. Rather, the imaging  
9 data is stored in the imaging data store located on the web service site, which is  
10 not shown in FIG. 1. Of course, users will have an imaging data store 54 that  
11 belongs to their user identification where they can store imaging data, which is  
12 the imaging data store shown in the imaging client 12. As a result, the term  
13 "personal imaging repository" 30 is meant as a conceptual term for an  
14 exchange infrastructure between the imaging data and the available web  
15 services on the Internet. Similar to the term "web," which denotes millions of  
16 distinct servers that comprise the web, the web does not actually do anything  
17 itself. In the present invention, the servers serving the imaging data store 54  
18 and the composition store 56 are physical implementations of the personal  
19 imaging repository 30 as a concept.

20 Because the web services are configured to access the personal  
21 imaging repository when a service is requested, the personal imaging  
22 repository 30 becomes the exchange infrastructure for the imaging data for the  
23 web services that are available on the Internet. Users no longer have to  
24 remember the directory in which they placed their imaging data. When the  
25 user requests a web service, the requested web service is configured to access  
26 the imaging data indicated by the selected imaging composition stored in the  
27 personal imaging repository. Furthermore, the imaging data is stored in the

1 personal imaging repository, where it can be freely utilized by additional  
2 available web services.

3           It should be noted that the personal imaging repository 30 can  
4 represent any type of data storage device. In fact, the data storage device 30  
5 does not necessarily have to be located within the imaging client computer 12.  
6 The personal imaging repository 30 can be located, for example, on another  
7 storage medium, which the client machine can access through alternative  
8 communication links. Although it is currently preferred to include the personal  
9 imaging repository 30 with the imaging client 12, this would likely change as  
10 bandwidth becomes faster and the popularity and storage capacity of the  
11 personal digital assistant ("PDA") increases. These alternative implementations  
12 are contemplated and should be considered to be within the scope of the  
13 present invention.

14           A second network system is shown in FIG. 2, and indicated  
15 generally at 60. Similar to the previous embodiment, an imaging client 62 is  
16 connected to a web service server 64 through a network connection 68. A  
17 connection with the web service server 64 is established by the imaging client  
18 62 when the user requests printing of imaging data from an application 70 to a  
19 requested web service 72 provided by the web service server. In the actual  
20 implementation, there would be multiple web services available. However, the  
21 imaging client 62 will only establish a connection with the web service that is  
22 requested by the user. The imaging client 62 similarly includes a display  
23 interface 76, an input interface 78 and a web browser 80 for displaying a web  
24 content 82 from the requested web service 72. In addition, a capture driver 84  
25 along with its components, namely, an uploader 86, a converter 88, a port  
26 monitor 90 and a printer driver 92, are all located on the imaging client 62. In



1 order for the capture driver 84 to work with the operating system, an API 94  
2 and a GDI 96 are also included in the system.

3           However, unlike the previous implementation, the personal  
4 imaging repository 98 is linked only to the imaging client 62 over a general  
5 communication link 100. In the present implementation, the personal imaging  
6 repository 98 can be a general data storage device, or it may be provided by  
7 another server computer connected to the imaging client. In fact, the imaging  
8 client 62 can be a PDA that links to the personal imaging repository 98 by  
9 using a cradle. The personal imaging repository 98 similarly includes an  
10 imaging data store 102 and a composition store 104. The personal imaging  
11 repository is still associated with user information 106 used by an extension  
12 component 108 of the browser 80.

13           Turning to an important aspect of the present invention, a flow  
14 chart of the preferred functionality of the print method is shown in FIG. 3, and  
15 indicated generally at 110. The print method is initiated by the user selecting  
16 to print imaging data from an application to the capture driver 40, 84 (block  
17 112). The application responds by directing the imaging data to the operating  
18 system (block 114). In turn, the operating system directs the imaging data to a  
19 printer driver (block 116). It is then determined whether the imaging data is in  
20 a predefined format that is suitable for printing to peripheral devices (block  
21 118). The printer driver converts the imaging data into the predefined format if  
22 necessary (block 120), and directs the imaging data in the predefined format  
23 back to the operating system (block 122). The operating system then redirects  
24 the imaging data to a port monitor (block 124).

25           After the port monitor receives the imaging data that is in the  
26 predefined format (block 126), the port monitor converts the imaging data into  
27 a default format of the personal imaging repository (block 128). After the

1 imaging data is converted into the default format, it is now ready to be  
2 transferred to the imaging data store (block 130). At this point, the port  
3 monitor creates an imaging composition that includes the link to the imaging  
4 data previously stored in the imaging data store (block 132), and the imaging  
5 composition is then saved into the composition store (block 134). As the last  
6 step, the port monitor directs the web browser of the imaging client to the  
7 requested web service for printing the imaging data (block 136).

8 From the foregoing description, it should be understood that an  
9 improved system and method for preparing imaging data for printing to a  
10 requested web service has been shown and described, which has many  
11 desirable attributes and advantages. The system and method provides for  
12 preparing imaging data for printing from an application to a requested web  
13 service that allows the imaging data to be later used by other web services. The  
14 imaging data is stored onto a personal imaging repository, which acts as an  
15 exchange infrastructure between the imaging data and available web services.  
16 Because the web services are configured to access the personal imaging  
17 repository for the imaging data, it is no longer necessary for the imaging data to  
18 be uploaded to the requested web service. Rather, once the imaging data is  
19 stored in the personal imaging repository, it can be used by any other web  
20 services or the user at a later time.

21 While various embodiments of the present invention have been  
22 shown and described, it should be understood that other modifications,  
23 substitutions and alternatives are apparent to one of ordinary skill in the art.  
24 Such modifications, substitutions and alternatives can be made without  
25 departing from the spirit and scope of the invention, which should be  
26 determined from the appended claims.



- 1           Various features of the invention are set forth in the appended
- 2   claims.